Appl. No. Filed Herewith
Amdt. dated June 19, 2003
Preliminary Amendment

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This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1-26 (canceled).

1   27.   (new) A method of generating an output symbol, wherein the output
2   symbol is selected from an output alphabet and the output symbol is such that an input file,
3   comprising an ordered plurality of input symbols each selected from an input alphabet, is
4   recoverable from a set of such output symbols, the method comprising:
5   calculating, according to a predetermined function, a list AL for each output
6   symbol to be output, wherein AL is an indication of W associated input symbols associated
7   with the output symbol to be output, and wherein weights W are positive integers that vary
8   between at least two values and are greater than one for at least one list; and
9   generating an output symbol value B from a predetermined function of the
10   associated input symbols indicated by AL for each output symbol to be output;
11   wherein the ratio of the number of possible output symbols to be output to the
12   number of input symbols in the plurality of input symbols is greater than is needed for any
13   expected signal-to-noise ratio.

1   28.   (new) The method of claim 27, further comprising:
2   obtaining a key I for each output symbol to be output, wherein I is unique for
3   each output symbol to be output and the number of possible keys is much larger than the
4   number of input symbols in the input file; and
5   wherein AL, W and B are calculated using I as an input.

1   29.   (new) The method of claim 28, wherein obtaining key I comprises
2   calculating key I according to a random function or pseudorandom function.

1   30.   (new) The method of claim 28, wherein calculating comprises
2   calculating W(I) according to a random function or pseudorandom function of I.

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1   31.   (new) The method of claim 28, wherein calculating comprises

2   calculating AL(I) according to a random function or pseudorandom function of I.

1   32.   (new) The method of claim 28, wherein each subsequent key I is one

2   greater than the preceding key.

1   33.   (new) The method of claim 28, wherein calculating comprises:

2   calculating, according to a predetermined function of I and a probability

3   distribution, a weight W(I), wherein the probability distribution is over at least two positive

4   integers, at least one of which is greater than one;

5   calculating a list entry for list AL(I); and

6   repeating the step of calculating a list entry for list AL(I) until W(I) list entries

7   are calculated.

1   34.   (new) The method of claim 33, wherein calculating W(I) comprises

2   determining W(I) such that W approximates a predetermined distribution over the key

3   alphabet.

1   35.   (new) The method of claim 34, wherein the predetermined

2   distribution is a uniform distribution.

1   36.   (new) The method of claim 34, wherein the predetermined

2   distribution is a bell curve distribution.

1   37.   (new) The method of claim 34, wherein the predetermined

2   distribution is such that W=1 has a probability of 1/K, where K is the number of input

3   symbols in the input file, and W=i has a probability of $1/i(i-1)$ for i=2,...K.

1   38.   (new) The method of claim 34, wherein the predetermined

2   distribution is such that, given tunable parameters R1 and R2 and K being the number of

3   input symbols in the input file, weight W=1 has a probability proportional to R1/K, weights

4   in a low-weight class ranging from weight W=2 to weight W=K/R2 - 1 have a probability

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5 proportional to $1/(W(W-1)(1-W \cdot R2/K))$ and weights in a high-weight class ranging from

6 weight $W=K/R2$ to weight $W=K$ have a selected probability distribution.

7   39.   (new) The method of claim 27, wherein the predetermined function of

8 the associated input symbols indicated by AL is an exclusive OR (XOR) of the input symbols

9 indicated by AL.

1   40.   (new) The method of claim 27, wherein the input alphabet and the

2 output alphabet are the same alphabet.

1   41.   (new) The method of claim 27, wherein the input alphabet comprises

2 2^{Mi} symbols and each input symbol encodes Mi bits and wherein the output alphabet

3 comprises 2^{Mo} symbols and each output symbol encodes Mo bits.

1   42.   (new) The method of claim 27, wherein calculating AL comprises:

2   identifying the number K of input symbols in the input file, at least

3 approximately and a weight W;

4   determining the smallest prime number P greater than or equal to K;

5   if P is greater than K, at least logically padding the input file with P-K

6 padding input symbols;

7   generating a first integer X such that $1 \leq X < P$ and a second integer Y such

8 that $0 \leq Y < P$;

9   setting the J-th entry in AL to $((Y + (J-1) \cdot X) \bmod P)$ for each J from 1 to W.

1   43.   (new) The method of claim 42, wherein setting the J-th entry in AL

2 for each J comprises:

3   setting the first entry $V[J=0]$ in an array V to Y;

4   setting the J-th entry $V[J]$ in the array V to $(V[J-1] + X) \bmod P)$ for each J

5 from 1 to W minus one; and

6   using the array V as the list AL.

7   44.   (new) A method of encoding a plurality of output symbols, each

8 according to claim 27, the method further comprising:

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9   generating a key I for each of the output symbols to be generated; and

10   outputting each of the generated output symbols as an output sequence to be

11   transmitted through a data erasure channel.

1   45.   (new) The method of claim 44, wherein each key I is selected

2   independently of other selected keys.